Which alternatives matter? The role of QUD and speaker knowledge in conditionals

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INTRODUCTION

We investigate the role of contextual alternatives in the interpretation of conditional statements.

Conditional statements often imply meanings that go beyond their literal content:

"If Mary mows the lawn, she will receive $5"

The phenomenon where conditionals in the form of "if p, q" are understood exhaustively by listeners to mean "if and only if p, q", thereby treating them as biconditionals, is often referred to as Conditional Perfection (CP) (Geis & Zwicky, 1971).

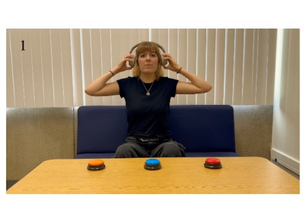
BACKGROUND

- CP occurs when the antecedent (*p*) of a conditional statement (*If p, then q*) is interpreted as exhaustively covering all conditions sufficient for the consequent (*q*).
- CP is often treated as a type of pragmatic strengthening, either grounded in Gricean reasoning (e.g., Grice, 1975; Horn, 1972) or formal grammatical algorithms (e.g., Chierchia, 2004; Fox, 2007).
- Quantity implicatures are shaped by:
  the contextually defined question under discussion (QUD), which can limit the domain of exhaustification thus blocking quantity implicatures (e.g., Hirschberg, 1985; von Fintel, 2001).

  the knowledge-state of the speaker, which can prevent a listener from taking the "epistemic step" that is necessary to compute an implicature (e.g., Sauerland, 2004).
- QUD effects on conditional perfection have been tested, findings mixed (strong effect, Farr, 2011; little/no effect, Cariani & Rips 2023; Grusdt et al. 2023)
- Speaker knowledge has never been tested (but see Bergen & Grodner 2012; Breheny et al. 2013; Hochstein et al. 2018; Goodman & Stuhlmüller 2013; Bale et al. 2024 for scalar implicatures)

EXP 1: The effect of QUD

98 Adults (Prolific), hosted on PCIbex, naturalistic inference task, where participants made decisions based on how they interpreted the conditional statement.



Mary puts her headphones on.

Mary presses all three buttons and listens.

Antecedent-focused: Which of these buttons will play a dog sound?

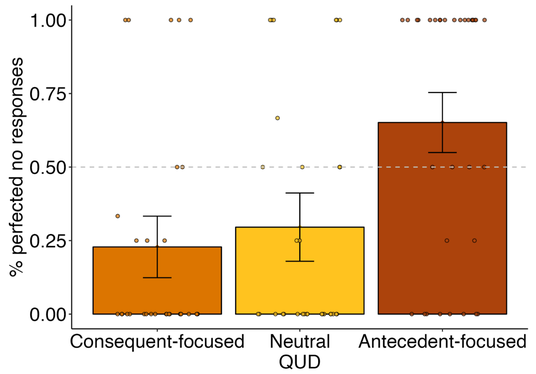
Consequent-focused: What will I hear if I press the red button?

Neutral: What will I hear if I press the buttons?

If you press the red button, it will play a dog barking.

Critical question: Do you think the orange button plays a dog sound?
(Yes / **No** / **Can't tell**)

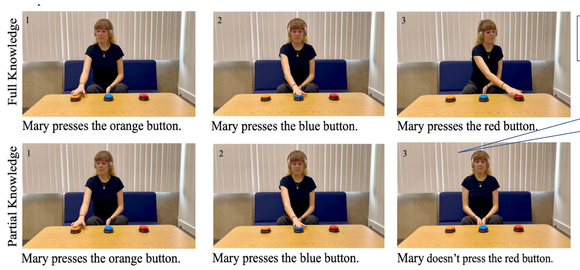
If participants interpret the conditional:
- **Literally:** More "Can't tell" responses
- **Pragmatically:** More "No" responses
- "Yes" responses were possible but not expected.



Experiment 1:
When the QUD focused on the **antecedent**, participants were more likely to interpret the conditional as exhaustive. When the QUD focused on the **consequent**, CP was less likely.

EXP 2: Speaker knowledge

72 Adults (Prolific)

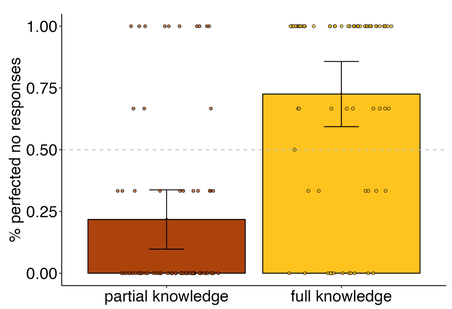


Antecedent-focused: Which of these buttons will play a dog sound?

If you press the red button, it will play a dog barking.

Conditions:
Full knowledge: The speaker tested all three buttons.
Partial knowledge: The speaker tested two buttons.

Critical question: Do you think the orange button plays a dog sound?
(Yes / No / Can't tell



Experiment 2:
CP was more likely when the speaker demonstrated **full knowledge** of all relevant antecedent statements compared to when the speaker's knowledge was **partial**.

DISCUSSION

- Robust evidence that both QUD and speaker knowledge shape conditional interpretation.
- Antecedent-focused QUDs reliably lead to CP.
- Speaker knowledge determines which alternatives listeners consider.
- **CP as a quantity implicature through exhaustification:** wherein the speaker is presumed to have mentioned all relevant conditions.
- Unlike other implicatures, CP can arise even when there is no clearly defined set of alternatives.
- Understanding the role of QUD and speaker knowledge in CP helps explain why children often favor pragmatic interpretations.

References will be moved here